



HHS Public Access

Author manuscript

Am J Ind Med. Author manuscript; available in PMC 2022 August 01.

Published in final edited form as:

Am J Ind Med. 2021 August ; 64(8): 667–679. doi:10.1002/ajim.23254.

The role of nonstandard and precarious jobs in the wellbeing of disabled workers during workforce reintegration

Amy T. Edmonds, BA^a, Jeanne M. Sears, PhD, MS, RN^{a,b,c,d}, Allyson O'Connor, MPH^a, Trevor Peckham, PhD, MPA^{a,b}

^aDepartment of Health Services, University of Washington, Seattle, WA, USA

^bDepartment of Environmental and Occupational Health Sciences, University of Washington, Seattle, WA, USA

^cHarborview Injury Prevention and Research Center, Seattle, WA, USA

^dInstitute for Work and Health, Toronto, Ontario, Canada

Abstract

Background: Nonstandard employment arrangements are becoming increasingly common and could provide needed flexibility for workers living with disabilities. However, these arrangements may indicate precarious employment, that is, employment characterized by instability, powerlessness, and limited worker rights and benefits. Little is known about the role of nonstandard and precarious jobs in the wellbeing of disabled persons during workforce reintegration after permanent impairment from work-related injuries or illnesses.

Methods: We used linked survey and administrative data for a sample of 442 Washington State workers who recently returned to work and received a workers' compensation permanent partial disability (PPD) award after permanent impairment from a work-related injury. Multivariable logistic regression models were used to examine associations between nonstandard employment and outcomes related to worker wellbeing and sustained employment. We also examined associations between a multidimensional measure of precarious employment and these outcomes. Secondarily, qualitative content analysis methods were used to code worker suggestions on how workplaces could support sustained return to work (RTW).

Name, mailing address, and email address for the corresponding author: Amy T. Edmonds, Department of Health Services, 1959 NE Pacific St, Box 357660, Seattle, WA 98195, edmonds8@uw.edu.

Author Contributions:

JMS designed the parent study, ATE and JMS designed the study. ATE performed all quantitative analyses and took the lead in writing the manuscript with contributions from JMS. ATE and JMS performed all coding for the content analysis. AO and TP contributed to the methods, interpretation of findings, and writing.

Institution: University of Washington, Seattle

Institution and Ethics approval and informed consent:

The parent study and secondary analysis of data were both approved by the University of Washington Institutional Review Board. Specifically, all procedures followed were in accordance with the ethical standards of the University of Washington Institutional Review Board and the 1964 Helsinki Declaration and its later amendments. All survey participants provided their informed consent prior to their inclusion in the study.

Publisher's Disclaimer: Disclaimer: The findings and conclusions in this report are solely the responsibility of the authors and do not necessarily represent the official views of the National Institute for Occupational Safety and Health.

Disclosure: The authors have no conflicts of interest to declare.

Results: Workers in (1) nonstandard jobs (compared to full-time, permanent jobs) and (2) precarious jobs (compared to less precarious jobs) had higher adjusted odds of low expectations for sustained RTW. Additionally, workers in precarious jobs had higher odds of reporting fair or poor health and unmet need for disability accommodation. Workers in nonstandard and precarious jobs frequently reported wanting safer and adequately staffed workplaces to ensure safety and maintain sustained employment.

Conclusions: Ensuring safe, secure employment for disabled workers could play an important role in their wellbeing and sustained RTW.

Keywords

Occupational Injuries; Return to Work; Disabled Persons; Precarious Employment; Nonstandard Employment

BACKGROUND

More than one in ten working-age persons in the United States (US) lives with a severe disability.¹ Workplace injuries are a common cause of disability among adults in the US.² Every year, approximately 300,000 US workers incur serious work injuries that result in permanent impairment, such as vision or hearing loss, amputation, or spinal impairment. Workers who experience work-related permanent impairment receive monetary assistance (e.g., permanent partial disability [PPD] award and temporary wage replacement) and medical benefits through a workers' compensation (WC) claim. This assistance may help to ease financial strain on the path to workforce reintegration.³ However, after WC claim closure, many workers with permanent impairment (which we describe broadly as work-related disabilities) face difficulties with sustained employment.^{4,5}

Persons with disabilities—including those with work-related disabilities—may often face hiring discrimination, workforce exclusion,^{6,7} and other social disadvantages that influence their health and wellbeing.⁸ Various studies have focused on identifying modifiable factors in the return-to-work (RTW) process to help workers with work-related disabilities stay healthy and employed.^{9–13} Solutions include providing assistive technologies¹⁴ and modifying psychosocial factors, such as coworker and supervisor support.¹⁵ However, despite the growing prevalence of nonstandard work arrangements and precarious employment in the occupational health and safety discourse,^{16–18} few studies have investigated the role of nonstandard and precarious jobs in the RTW process.^{19,20}

Nonstandard work arrangements have become increasingly common in the US and globally.²¹ Nonstandard work arrangements are typically defined in contrast to normative job expectations in contemporary labor markets, namely, full-time, permanent, regularly scheduled work arrangements with a single employer.²² Common nonstandard work arrangements include part-time, staffing agency, and independent contractor jobs.^{18,22} The flexibility, part-time nature, and ease of entry into some nonstandard jobs may offer RTW opportunities for persons with disabilities.^{23,24} However, nonstandard jobs are generally associated with decreased job security, lower wage and benefit levels, and worse working

conditions,^{18,25} raising questions about their benefit and link to the construct of precarious employment.

While nonstandard work arrangements are typically defined solely by the contractual aspects of a job, precarious employment is a multidimensional construct characterized by job insecurity, a lack of worker protections, and social and economic vulnerability.^{26–28} Employment in a nonstandard job is a common indicator of precarious employment;²⁹ however, unidimensional indicators of contract type generally fail to capture the many other aspects of employment relationships that affect a worker's experience in a job (e.g., worker-employer power relations, workplace rights, job security).^{26,28} Multidimensional approaches to defining precarious employment broaden the view of how employment affects health and wellbeing and better identify workers burdened by precarious employment. Indeed, epidemiologic studies have identified differing associations with health outcomes when using unidimensional measures of nonstandard employment compared to multidimensional measures of precarious employment.²⁹

Evidence suggests that precarious employment has also become a more common experience in recent decades.³⁰ The growth of both nonstandard and precarious jobs is believed to reflect overarching global, political, and economic forces, including declining unionization, financialization (e.g., the rise of shareholder power), globalization, and the rise of digital technologies and the gig economy.²² Concerningly, these changes may exacerbate job insecurity and health and safety risks for workers.^{18,31} These jobs can be financially and psychologically stressful,^{32,33} as well as physically hazardous due to worse access to job accommodation, shorter job tenure, and less safe work environments.^{16,17} While little is known about the role of nonstandard and precarious jobs in the lives of people with work-related disabilities, it is known that people with disabilities are generally overrepresented in both nonstandard and precarious jobs.^{23,34,35} Therefore, there is a critical need for more research on the role of nonstandard and precarious jobs in the wellbeing of disabled persons, including those with work-related disabilities.

Workers with disabilities report similar employment-related preferences to people without disabilities³⁶—but are twice as likely to be unemployed.³⁷ While the literature is not specific to workers with work-related disabilities, some studies suggest that workers with disabilities may prefer the flexibility offered by nonstandard jobs,²⁴ especially workers with health limitations or other concerns that make it difficult to sustain full-time employment.^{24,35,38} However, workers with disabilities may be disproportionately employed in nonstandard and precarious jobs due to limited job options.²³ Therefore, concerns abound that nonstandard and precarious jobs could undermine the documented health and economic benefits of employment³⁹ by placing people with disabilities at high risk of financially unsustainable, unsafe, and stressful working conditions.⁴⁰ These may be important considerations for healthy and sustained employment for people returning to work after experiencing a work-related disability.

A limited literature outside the US, not specific to persons with work-related disabilities, suggests that nonstandard and precarious jobs are worse for persons with disabilities. A British study identified that nonstandard employment was associated with poorer health and

transitions to economic inactivity among intellectually disabled workers.⁴⁰ Canada-based studies linked nonstandard jobs to lower life satisfaction and more limited access to disability accommodation among disabled workers.^{41,42} The challenges of nonstandard and precarious jobs may be exacerbated for disabled workers in the US due to a more limited social safety net and fewer universal workplace protections.⁴³ Yet, to our knowledge, no US-based studies have explicitly examined the role of nonstandard and precarious jobs in health, financial, and workplace experiences among workers with disabilities, particularly for those who have recently reentered the workforce after a work-related disability.

Using a representative survey of disabled workers on their experiences of workplace reintegration after receiving a WC PPD award in Washington State (WA), we examined (1) factors associated with nonstandard work arrangements and (2) the health and financial implications of such work arrangements. We repeated these analyses among disabled workers using a multidimensional measure of precarious employment. Secondly, we summarized open-ended survey responses to describe suggestions for promoting sustained employment and preventing reinjury from disabled workers engaged in nonstandard and precarious jobs.

METHODS

Data sources and study population

This study was a secondary analysis of an exploratory survey on work reintegration in the first year after a workplace injury. The survey gathered retrospective information from a representative cohort of WA workers with permanent impairment and a PPD award. WA defines impairment as permanent anatomic or functional abnormality or loss of function after maximum medical improvement has been achieved.⁴⁴ Workers may be rated with regard to the degree of impairment for a PPD award if treatment has been completed and the worker is still able to work, but has suffered a permanent loss of function.⁴⁵ The parent study's overall adjusted response rate was 53.8%, using the standard Response Rate 4 formula published by the American Association for Public Opinion Research.⁴⁶ No evidence of substantial response bias was identified.⁵ Detailed information on the data, response rate calculations, and research methods for the parent study are published elsewhere.⁵

Two data sources were linked for the parent study: (1) the worker survey and (2) administrative data from the WA Department of Labor and Industries (L&I). WA has a single-payer WC system known as the State Fund. L&I performs an insurer's functions for State Fund claims and administers the state WC system for both State Fund and self-insured employers. Together, the State Fund (accounting for about 70% of employers) and self-insured employers (accounting for about 30% of employers) cover all workers specified by WA's Industrial Insurance Act.⁴⁷ L&I provided WC claims data and contact information. Variables included claim descriptors (e.g., State Fund or self-insured coverage), sociodemographic information (e.g., sex, age, county of residence), employment information at the time of the pertinent injury, and permanent disability information (e.g., PPD status and dates, impairment percentages).

The worker survey was developed by researchers in collaboration with L&I experts and stakeholders. The Survey Research Division of the Social Development Research Group, an interdisciplinary research team based in the University of Washington School of Social Work, provided expert consultation and computer-assisted telephone interviewing. L&I identified 2,541 workers who were potentially eligible for the survey and whose claims closed with a PPD award from January through April 2018. Interviews for 599 workers who agreed to participate were conducted between February and April 2019 (approximately a year after claim closure), of which 582 were completed. For this analysis, we limited the sample to workers who: (1) did not report self-employment, (2) were employed at the time of the interview, and (3) had complete data on key covariates. The final sample for the quantitative analysis consisted of 442 workers (shown in Figure 1). We used qualitative methods to inductively code responses from an open-ended survey question on suggestions for sustained RTW for 50 workers in nonstandard and precarious jobs who were in the final quantitative sample. This secondary analysis was approved by the University of Washington Institutional Review Board.

Measures

Defining Nonstandard and Precarious Jobs—We examined employment in nonstandard and precarious jobs as exposures in this study. Employment in a nonstandard job was defined as working in a temporary, part-time, or seasonal employment arrangement instead of a full-time, permanent employment arrangement at the time of the interview. Since the survey was not originally developed to measure precarious employment, we developed an exploratory measure of precarious employment by summing several indicators. Precarious employment has been conceptualized and operationalized in various ways.⁴⁸ Measures of precarious employment often include both objective and subjective indicators, including those relating to drivers of precarious employment, the employment relationship itself, or outcomes/correlates downstream of precarious employment.⁴⁹ In this study, we followed recent guidance within the occupational health literature that measurement of precarious employment should occur at the level of the worker-employer relationship.⁵⁰ Specifically, we defined precarious employment as a multidimensional measure of jobs characterized by five dimensions: 1) job insecurity, 2) individualized (as opposed to collective) bargaining relations, 3) limited workplace rights and social protection, 4) powerlessness to exercise rights and vulnerability to hazards and 5) low wages and economic deprivation.^{22,48}

We identified six indicators suitable for constructing a precarious employment measure, representing four of these five conceptual dimensions. The first precarious employment dimension, job insecurity, was operationalized by two indicators: (1) whether the worker reported being employed in a nonstandard work arrangement (versus a full-time, permanent employment arrangement) and (2) whether the worker reported they strongly disagree or somewhat disagree (versus somewhat agree or strongly agree) with the statement, “My job security is good.” For the second dimension, bargaining relations were operationalized by the worker’s union membership status. Union representation can serve to regulate power dynamics between workers and management and facilitate the improvement of working and employment conditions.^{51,52} A worker reporting no union membership indicated more

precarious employment. For the third dimension, employment that provides limited workplace rights and social protections was operationalized by whether the worker reported having employer-provided health insurance. For the fourth dimension, powerlessness to exercise rights and vulnerability to hazards was operationalized by two indicators: (1) whether the worker reported not being comfortable reporting either an occupational injury or an unsafe work environment, and (2) the worker's response to validated safety climate instruments developed to measure safety culture at the organizational and supervisory level.⁵³ For safety climate, workers were considered to be less protected from workplace hazards if their score on either the organizational or supervisory scale was one or more standard deviations below the means for the reference worker population. The reference worker population was based on the safety climate instrument validation study (N=29,179 workers at N=46 companies).⁵³ We did not include low wages or economic deprivation as an indicator in the precarity score because we were unable to identify suitable measures in the survey. To calculate the precarious employment score, we summed these six binary indicators. Workers with three or more indicators of precarious employment were considered to be employed in a precarious job; workers with fewer than three indicators were considered to be employed in a less precarious job. This cutoff represents greater than one standard deviation above the mean count of precarity indicators in our study sample [mean, (SD): 1.4, (1.2)].

Outcomes—We examined three outcomes related to (1) worker health, (2) financial strain, and (3) work-related experiences that could influence sustained employment. All outcomes were dichotomized for ease of interpretation. We examined three health-related outcomes: (1) poor self-rated health (poor or fair versus good, very good, or excellent) at the time of the interview, (2) poor sleep quality in the past seven days, and (3) reinjury resulting in at least one missed workday in the job held when interviewed. We assessed poor sleep quality using the Patient-Reported Outcomes Measurement Information System (PROMIS) sleep disturbance short-scale. Scores were standardized to a relevant reference population of adults,⁵⁴ and workers had high sleep disturbance (poor sleep quality) if their score was one standard deviation or more above average.

Financial strain was defined by workers stating they often or sometimes worried their total income would not be enough to meet their expenses and bills, along with an affirmative response to at least one of the following situations: (1) they had been contacted by a collection agency because of unpaid bills in the past three months, or (2) they had been at risk of losing their housing because of unpaid or underpaid rent or mortgage payments in the past three months. These economic risk questions were drawn from a previous study of injured workers in WA.⁵⁵

We assessed two work-related experiences related to sustained employment. First, unmet need for job accommodation was defined by workers expressing that they needed disability accommodation but did not receive it (versus needing and receiving accommodation, or not needing accommodation). Second, low expectations for sustained RTW were defined by workers being very or somewhat uncertain they would still be employed six months after their interview. A worker's expectations surrounding RTW is known to be an important indicator of future employment status.⁵⁶

Covariates—Covariates conceptualized as confounders fell into three categories: (1) sociodemographic characteristics, (2) injury and health-related characteristics, and (3) employment/work-related characteristics. Sociodemographic characteristics included age (categorized into 18–34, 35–44, 45–54, and 55 or older), sex (male or female), educational attainment (high school diploma/GED or less, some college, 4-year college or greater), race/ethnicity (Hispanic/Latino, White, Black/African American, Asian or Native Hawaiian/Pacific Islander (NHPI), or multiple/ other). Each worker was assigned a six-level 2013 National Center for Health Statistics Urban-Rural Classification Scheme for Counties rurality designation: large central metropolitan (akin to inner cities), large fringe metropolitan (akin to suburban areas), medium metropolitan, small metropolitan, micropolitan, and noncore.⁵⁷ Non-metropolitan counties (micropolitan and noncore) were combined due to data sparsity in these categories for nonstandard workers. Injury and health-related characteristics included impairment rating and self-reported health at claim closure. Impairment rating was dichotomized into whether the worker had a 10% or higher whole body impairment rating, based on a published methodology.⁵ Self-reported health at claim closure was categorized (excellent, very good, good, fair, and poor). Employment/work-related characteristics were comprised of covariates specific to this population of injured workers. These characteristics included the type of WC coverage (self-insured vs. State Fund), whether workers had more than one job since their WC claim closed, or returned to work with an employer other than the employer of injury. We also adjusted for whether workers changed their occupation after their injury, which could be related to their transition into precarious or nonstandard employment, as well as their physical and emotional wellbeing. Characteristics such as the workers' highest level of educational attainment, race/ethnicity, self-reported health at claim closure, and employment and system characteristics were self-reported and sourced from survey data. All other covariates were sourced from the linked WC administrative claims data.

Analytical Approach

Quantitative Analysis—We first described the sample characteristics and the prevalences of the outcomes for the overall sample and by the non-mutually exclusive nonstandard and precarious job categorizations. Then, we used unadjusted and adjusted logistic regression models with robust standard errors to examine associations between employment in nonstandard and precarious jobs (analyzed as separate predictors), and worker health, financial stability, and sustainable employment outcomes. We adjusted for the same set of covariates representing sociodemographic characteristics, injury and health-related characteristics, and employment/work-related characteristics in each analysis. Due to multicollinearity in sleep quality models,⁵⁸ race/ethnicity was collapsed into a three-category variable (Hispanic/Latino, White, other). We used Stata version 15.1 to perform all quantitative analyses.⁵⁹

Qualitative Analysis—For the secondary aim examining workers' suggestions for promoting sustained employment and preventing reinjury, we examined data from a subsample of nonstandard and/or precarious workers with valid open-ended responses. We used Dedoose version 8.3.35⁶⁰ and qualitative content analysis methods to inductively code responses to the open-ended telephone survey question, “If you could suggest one change to

the structure, environment, or culture of your current workplace (your job at the time of the interview) that would help you to continue working or prevent reinjury, what would it be?" Trained interviewers recorded workers' responses verbatim or in summary. Following a content analysis approach,⁶¹ two coders (ATE and JMS) independently coded approximately one-third of total responses. Responses that were vague or unclear, where the worker reported no change, don't know, no suggestion, or did not respond, were flagged for exclusion, as they were not considered codable responses for the question. For remaining responses, given the nature of the interview question, we did not approach these data with expectations, and codes were developed inductively. As responses were often detailed and multifaceted, responses were allowed assignment by more than one code. We then compared our code assignments and came to consensus on an initial coding scheme and codebook. The remaining responses were independently coded using this schema. Discordant codes between coders were reviewed, and consensus on final codes was reached. Codes were further grouped for improved interpretability where appropriate. Codes were tabulated to identify the most frequent suggestions for promoting sustained RTW among workers in nonstandard and precarious jobs. Code percentages do not sum to 100% since workers could offer more than one distinct workplace suggestion.

RESULTS

Descriptive quantitative findings

Table 1 shows that approximately 12% of the 442 workers in the study sample were employed in nonstandard work arrangements, and 16% were employed in precarious employment. Of workers employed in nonstandard work arrangements (n=54), 63% were identified to be working in precarious jobs, as well. Of workers employed in full-time, permanent jobs (n=388), around 10% were in precarious jobs.

In the overall sample, the mean age was 49 years old (SD:11), and 32% of workers identified as female. Most workers resided in more urban counties classified as large central metropolitan or large fringe metropolitan. One out of four workers reported their health at claim closure to be fair or poor, and over 20% of workers had a whole body impairment of 10% or higher. Concerning employer and WC characteristics, one out of four workers were not employed by their pre-injury employer, and over a quarter of workers reported doing a different type of work than they had before the injury/illness. Furthermore, 19% of workers were working a job different than their first job after RTW.

Workers employed in nonstandard and full-time, permanent employment arrangements were compared in Table 1. Compared to workers in full-time, permanent employment arrangements, workers in nonstandard jobs tended to be younger, female, non-White, have higher levels of educational attainment, and live in more urban counties. Regarding health and impairment characteristics, nonstandard workers tended to report worse self-rated health and more severe impairment (i.e., higher prevalence of 10% or greater whole body impairment). Workers in nonstandard jobs had a higher prevalence than those in full-time, permanent employment arrangements of reporting (1) more than one job since their WC claim closed, (2) doing a different type of work than before the injury that caused their impairment, and (3) not returning to work with the pre-injury employer. Workers in

precarious jobs had similar characteristics to those employed in nonstandard jobs (Table 1). As shown in Table 2, workers in nonstandard and precarious jobs had higher proportions of poor self-reported health, poor sleep quality, unmet need for accommodation, financial strain, and low RTW expectations compared to those in full-time, permanent and less precarious jobs, respectively.

Outcomes associated with nonstandard and precarious jobs

Unadjusted and adjusted logistic regression models examining outcomes associated with nonstandard and precarious jobs are presented in Table 3. Nonstandard jobs were associated with a three-fold higher odds of low expectations for sustained RTW (Adjusted Odds Ratio; AOR: 3.18, 95% CI: 1.55–6.53). This was the only significant association between nonstandard jobs and the outcomes. In adjusted models, precarious employment was significantly associated with fair/poor self-rated health (AOR: 2.35, 95% CI: 1.21–4.53), unmet need for job accommodation (AOR: 3.90, 95% CI: 1.89 – 8.07), and low expectations for sustained RTW (AOR: 3.13, 95% CI: 1.65–5.92). No statistically significant associations were observed between precarious employment and financial strain or poor sleep quality in adjusted models.

Worker suggestions

Of the 92 workers in the quantitative analyses in nonstandard and/or precarious jobs, 42 offered responses that were not considered valid and codable. The subsample analyzed in the qualitative analysis (n=50) with codable responses had similar sociodemographic and health characteristics to the broader group of workers in nonstandard jobs described in Table 1. Of workers in this subsample, 52% were employed in nonstandard jobs, 80% were in precarious jobs, and 32% were in both nonstandard and precarious jobs. Workers employed in nonstandard and/or precarious jobs at the time of their interview had various suggestions for ways workplaces could support disabled workers' sustained employment and physical wellbeing. Frequent suggestions (10% of responses) are summarized in Figure 2.

The most frequent suggestions emphasized the importance of safety precautions and safer workplaces (20% of workers) as well as reasonable staffing and task distribution (20% of workers). With respect to safety precautions and safe workplaces, workers reported that various aspects of their current workplaces could be safer. They specifically described the need to improve unsafe equipment (including dangerous equipment related to their initial injury that was not addressed), trip hazards, inadequate facilities, and cleanliness issues within their workplaces. Concerning staffing and task distribution, many workers described that their workplaces were understaffed or could be staffed in safer ways, such as having more people on the same shift. Some workers commented on the drivers of understaffing in their workplaces, such as poor management and turnover, as well as the negative consequences of understaffing on their wellbeing. For instance, one worker specifically described that understaffing led to overtime for workers in their firm and connected this to an increased risk of injury.

Other frequent suggestions pertained to safety climate (12%), social support in the workplace (12%), RTW issues (10%), and ergonomics and rest breaks (10%). Safety climate

was alluded to by workers in several ways. One worker described perceived attitudes of management (e.g., finances viewed as more important to top managers than implementing safety protocols). Other workers described the need for better communication regarding job safety and hazards, as well as better accountability systems to ensure safety. One worker specifically described that their company put workers in unsafe situations without providing needed personal protective equipment or safety training. Workers mentioned support from management as generally important, and social support as being valuable in the RTW process. For example, one worker mentioned how important it was to feel supported by managers and coworkers upon RTW. Several other workers described their wish for more support in the RTW process, and one worker wished their employer was more empathetic and supportive of time off for needed health care.

Other RTW-specific suggestions included the need for manager training related to injured employees and ensuring managers were educated in ways to avoid asking their injured employees to perform unsafe tasks. Finally, workers noted the need for job accommodations (e.g., a stool to elevate one's leg), ergonomics, and rest breaks. For ergonomics and rest breaks, workers stated the importance of supports that would be helpful, including comfortable chairs, resting opportunities, and less repetitive work. Less frequent worker suggestions (<10% each) included workplace health promotion efforts, addressing high demands and job strain, providing safety training, effective communication, ensuring safe equipment, fair (non-discriminatory) treatment, enhancing health care access or receipt, and improving rights and/or pay.

DISCUSSION

We found that disabled workers in nonstandard and precarious jobs reported a higher prevalence of challenges – including poor health, financial strain, poor sleep, and limited job accommodations after workforce reintegration – than their counterparts with full-time, permanent and less precarious jobs. Additionally, one in three workers in nonstandard and precarious jobs held low expectations for their sustained employment. Using adjusted multivariable logistic regression models, we identified that both nonstandard and precarious jobs were associated with low expectations for sustained RTW. We also identified that precarious employment (compared to less precarious employment) was associated with an unmet need for job accommodation and fair/poor health. This association between precarious employment and poor health for disabled workers is consistent with previous research linking precarious employment to poorer self-rated health for a wide variety of worker populations.²⁶ Unlike a study not specific to disabled workers,⁶² we did not identify statistically significant associations between nonstandard or precarious jobs and sleep disturbance. This may be due to our definition of precarious employment, which may not fully capture facets of precarious employment (e.g., subjective experiences of insecurity) that may be most strongly associated with poor sleep.⁶² Overall, this study extends the literature on implications of nonstandard and precarious employment beyond general worker populations to workers returning to work after a work-related disability.

Our finding that nonstandard and precarious jobs were associated with low sustained RTW expectations is concerning given the large body of evidence suggesting that disabled

workers' expectations predict their future employment.⁵⁶ Although sustained RTW expectations have been underexplored, these findings raise concerns that nonstandard and precarious jobs may be more likely to facilitate transitions out of the workforce entirely, instead of being stepping-stones to more secure employment arrangements. Indeed, prior studies identified that more precarious employment arrangements were associated with lower job satisfaction⁶³ and stress.³⁶ Other studies detailed how aspects of nonstandard and precarious jobs could lead workers to believe these jobs to be unsustainable in the long-term.³⁸

Compared to workers in less precarious jobs, workers in precarious jobs had a higher odds of unmet need for accommodation. According to Shuey and Jovic (2013), workers in precarious jobs may be more likely to underreport disabilities and disability-related accommodation needs due to their perceived expendability and concerns about discrimination.⁴² Additionally, workers in precarious jobs had a higher odds of reporting fair or poor health (even after adjusting for health at claim closure) than workers in less precarious jobs. This is unsurprising given that precarious jobs are often laden with psychologically and physically stressful conditions that could lead to declines in health status.²⁶

In this study, we examined the same set of outcomes in relation to two measures of employment: employment in a nonstandard work arrangement—frequently used as a unidimensional measure of precarious employment—and a multidimensional measure of precarious employment. Our finding that these two measures had different associations with outcomes was not surprising. While examining nonstandard work arrangements is common in the literature, these jobs tend to be heterogeneous in character with little consensus on how to categorize and define them (e.g., contractor jobs include both flexible contract work tailored towards high-skilled workers as well as low-paid gig work).¹⁸ Furthermore, these nonstandard work arrangements may not capture important aspects of precarious employment, such as unbalanced worker-employer power dynamics central to the precarious employment construct. We developed a multidimensional measure to more thoroughly capture precarious employment experiences than a measure of nonstandard work arrangement can provide. Accordingly, we observed an incomplete overlap between workers in nonstandard and precarious jobs in the study.

Finally, to contribute to a fuller understanding of ways in which disabled workers in nonstandard and precarious jobs suggest their workplaces could be improved, we used qualitative content analysis methods to code open-ended suggestions. The most frequent suggestions were related to the need for enhanced safety precautions and workplace safety, improved staffing and task distribution, a safety-promoting workplace culture, and social support. Suggestions, particularly those related to safety, were unsurprising given workers' prior experiences with work-related injury or illness. It was concerning, however, that many workers in nonstandard and precarious jobs referred to continued safety challenges in their current workplaces, considering their elevated risk of reinjury.⁶⁴ Furthermore, issues of inadequate staffing reported by workers align with cost-cutting measures characteristic of industries that increasingly rely on more precarious workforces.⁶⁵ While many of these workplace conditions are modifiable through policy changes, others are arguably outside of

the typical realm of RTW interventions. Specifically, staffing levels are inherently structured by employer incentives to maintain a safe and satisfied workforce and workers' ability to communicate needs to managers and advocate for improved workplace conditions.⁶⁶ Nonetheless, worker suggestions could guide prioritization of WC system-level improvements to assist disabled workers as they reintegrate into the workforce.

Strengths and limitations

This study is the first, to our knowledge, to investigate the role of nonstandard and precarious jobs in RTW-related outcomes among US persons with disabilities. We leveraged a representative WA survey of workers who returned to work after a work-related permanent impairment to explore the influence of nonstandard and precarious jobs in multiple worker-reported outcomes. The outcomes we assessed, related to worker health, financial wellbeing, and sustained employment, offer a detailed picture of overall wellbeing upon RTW. Additionally, this study was uniquely able to supplement primary findings with suggestions from workers in nonstandard and/or precarious jobs for promoting their sustained wellbeing and employment.

This study had several limitations related to internal validity and generalizability. Exposure to a nonstandard and precarious job may not predate all outcomes we assessed due to the survey's cross-sectional nature, despite our efforts to assess temporally relevant outcomes. Longitudinal research could be particularly valuable in disentangling the role of nonstandard and precarious jobs in the trajectories of disabled workers before, during, and after RTW. Also, while all covariates we adjusted for predate the outcomes assessed, we could not evaluate and adjust for the duration of worker exposure to a nonstandard or precarious job upon RTW. Length of exposure may be a particularly important confounder of the relationship between employment type and the reinjury outcome. Finally, our measure of precarious employment is exploratory. We developed the precarious employment measure using several available proxy indicators as the parent study was not developed specifically to measure this construct. Since we could not incorporate some important aspects of the precarious employment construct, such as inadequacy of wages, our strategy is not fully aligned with the latest recommendations for measuring precarious employment.⁶⁷

Due to survey eligibility criteria, findings from this study may not be generalizable to workers with disabilities not acquired at work or to workers with disabilities acquired at work who did not qualify for, apply for, or receive WC benefits. For example, many workers (e.g., migrant farmworkers, domestic workers) may be excluded from WC coverage.⁶⁸ Also, our analysis is limited to wage earners; however, many self-employed workers are engaged in work arrangements that are typically defined as nonstandard (e.g., independent contractors). Self-employed workers are a heterogeneous group, and recent evidence suggests that some of these workers are in very precarious arrangements.⁶⁹ Finally, not all surveyed workers in nonstandard and precarious jobs had valid open-ended responses available for the secondary analysis of workplace suggestions. Despite similarities in descriptive characteristics, it is unclear whether our subsample of workers with valid open-ended responses is representative of broader samples of workers in nonstandard and precarious jobs.

Conclusion

This study is among the first to examine the role of nonstandard and precarious employment for disabled workers during the RTW process.¹⁹ It complements a larger body of research identifying the potential negative influence of nonstandard and precarious employment among populations of workers without disabilities. Our findings highlight how nonstandard and precarious employment may pose unique risks to the wellbeing of disabled workers. These workers may experience added social vulnerabilities due to marginalization (e.g., fewer job opportunities due to discrimination, less empowered to demand improved conditions), in addition to heightened physical vulnerabilities which could amplify workplace safety concerns and stressors. Our finding that workers in nonstandard and precarious jobs (compared to full-time, permanent and less precarious jobs) were more likely to report low expectations for sustained RTW suggest that these jobs may be particularly taxing for workers reentering the workforce after sustaining a work-related disability. We also identified that safety concerns and staffing issues were frequently mentioned as areas of concern by disabled workers in nonstandard and precarious jobs. As nonstandard and precarious jobs become increasingly common, these findings could inform federal and state vocational rehabilitation and transitional RTW efforts to help disabled workers with transitions into safe and secure employment. Additional research is needed to understand the long-term health and employment repercussions of nonstandard and precarious jobs during workforce reintegration. Such research could help clarify disabled workers' employment expectations, their decisions to enter nonstandard and precarious jobs, and their health and safety experiences within these jobs.

Data Availability Statement:

The data that support the findings of this study are not available for data-sharing due to privacy and third-party restrictions.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

Acknowledgements:

We are grateful to all survey participants.

Funding:

The research reported herein was performed pursuant to a grant from Policy Research, Inc. as part of the US Social Security Administration's (SSA's) Analyzing Relationships Between Disability, Rehabilitation and Work. We also acknowledge funding from National Institute for Occupational Safety and Health (NIOSH) Training Grant (# T42OH008433) and funding for the parent study, supported by the NIOSH under Grant R21OH011355. The opinions and conclusions expressed were solely those of the authors and do not represent the opinions or policy of Policy Research, Inc., SSA, NIOSH, or any other agency of the Federal Government.

REFERENCES

1. Brault MW. Americans with Disabilities: 2010. US Department of Commerce, Economics and Statistics Administration; 2012.

2. O’Leary P, Boden LI, Seabury SA, Ozonoff A, Scherer E. Workplace injuries and the take-up of Social Security disability benefits. *Soc Secur Bull.* 2012;72(3):1–17.
3. Workers’ Compensation Benefits, Costs, and Coverage – 2017 Data. National Academy of Social Insurance. <https://www.nasi.org/research/2019/report-workers'-compensation-benefits-costs-coverage--2017>. Accessed April 9, 2020.
4. Butler RJ, Johnson WG, Baldwin ML. Managing work disability: Why first return to work is not a measure of success. *ILR Rev.* 1995;48(3):452–469. doi:10.1177/001979399504800305
5. Sears JM, Schulman BA, Fulton-Kehoe D, Hogg-Johnson S. Workforce reintegration after work-related permanent impairment: A look at the first year after workers’ compensation claim closure. *J Occup Rehabil.* 2020; 1–13. doi:10.1007/s10926-020-09912-z
6. Kruse D, Schur L, Rogers S, Ameri M. Why do workers with disabilities earn less? Occupational job requirements and disability discrimination. *Br J Ind Relations.* 2018;56(4):798–834. doi:10.1111/bjir.12257
7. Ameri M, Schur L, Adya M, Bentley FS, McKay P, Kruse D. The disability employment puzzle: A field experiment on employer hiring behavior. *ILR Rev.* 2018;71(2):329–364. doi:10.1177/0019793917717474
8. Krahn GL, Walker DK, Correa-De-Araujo R. Persons with disabilities as an unrecognized health disparity population. *Am J Public Health.* 2015;105 Suppl 2(S2):S198–206. doi:10.2105/AJPH.2014.302182 [PubMed: 25689212]
9. Cancelliere C, Donovan J, Stochkendahl MJ, et al. Factors affecting return to work after injury or illness: Best evidence synthesis of systematic reviews. *Chiropr Man Ther.* 2016;24(1). doi:10.1186/s12998-016-0113-z
10. Cullen KL, Irvin E, Collie A, et al. Effectiveness of workplace interventions in return-to-work for musculoskeletal, pain-related and mental health conditions: An update of the evidence and messages for practitioners. *J Occup Rehabil.* 2018;28(1):1. doi:10.1007/s10926-016-9690-x [PubMed: 28224415]
11. Darter BJ, Hawley CE, Armstrong AJ, Avellone L, Wehman P. Factors influencing functional outcomes and return-to-work after amputation: A review of the literature. *J Occup Rehabil.* 2018;28(4):656–665. doi:10.1007/s10926-018-9757-y [PubMed: 29397480]
12. Etuknwa A, Daniels K, Eib C. Sustainable return to work: A systematic review focusing on personal and social factors. *J Occup Rehabil.* 2019;29(4):679–700. doi:10.1007/s10926-019-09832-7 [PubMed: 30767151]
13. Krause N, Frank JW, Dasinger LK, Sullivan TJ, Sinclair SJ. Determinants of duration of disability and return-to-work after work-related injury and illness: Challenges for future research. *Am J Ind Med.* 2001;40(4):464–484. doi:10.1002/ajim.1116 [PubMed: 11598995]
14. Sundar V, O’Neill J, Houtenville AJ, et al. Striving to work and overcoming barriers: Employment strategies and successes of people with disabilities. *J Vocat Rehabil.* 2018;48(1):93–109. doi:10.3233/JVR-170918
15. Jetha A, LaMontagne AD, Lilley R, Hogg-Johnson S, Sim M, Smith P. Workplace social system and sustained return-to-work: A study of supervisor and co-worker supportiveness and injury reaction. *J Occup Rehabil.* 2018;28(3):486–494. doi:10.1007/s10926-017-9724-z [PubMed: 28861667]
16. Ahonen EQ, Baron SL, Brosseau LM, Vives A. Health and safety issues for workers in nonstandard employment. *Oxford Research Encyclopedia of Global Public Health.* 2018. doi:10.1093/ACREFORE/9780190632366.013.68
17. Howard J Nonstandard work arrangements and worker health and safety. *Am J Ind Med.* 2017;60(1):1–10. doi:10.1002/ajim.22669 [PubMed: 27779787]
18. O’Connor A, Peckham T, Seixas N. Considering work arrangement as an “exposure” in occupational health research and practice. *Front Public Heal.* 2020;8. doi:10.3389/fpubh.2020.00363
19. Senthanaar S, MacEachen E, Lippel K. Return to work and ripple effects on family of precariously employed injured workers. *J Occup Rehabil.* 2020;30(1):72–83. doi:10.1007/s10926-019-09847-0 [PubMed: 31309411]

20. Maas ET, Koehoorn M, McLeod CB. Return-to-work for multiple jobholders with a work-related musculoskeletal disorder: A population-based, matched cohort in British Columbia. *PLoS One*. 2018;13(4):e0193618. doi:10.1371/journal.pone.0193618 [PubMed: 29614128]
21. Spreitzer GM, Cameron L, Garrett L. Alternative work arrangements: Two images of the new world of work. *Annu Rev Organ Psychol Organ Behav*. 2017;4:473–499. doi:10.1146/annurev-orgpsych
22. Kalleberg AL, Vallas SP. Probing precarious work: Theory, research, and politics. *Precarious Work Res Sociol Work*. 2018;31:1–30. doi:10.1108/S0277-283320170000031017
23. Kaye HS. Stuck at the bottom rung: Occupational characteristics of workers with disabilities. *J Occup Rehabil*. 2009;19(2):115–128. doi:10.1007/s10926-009-9175-2 [PubMed: 19350371]
24. Donovan SA, Bradley DH, Shimabukuru JO. What Does the Gig Economy Mean for Workers?; 2016. http://digitalcommons.ilr.cornell.edu/key_workplace. Accessed February 26, 2019.
25. Kalleberg AL. Nonstandard employment relations: Part-time, temporary and contract work. *Annu Rev Sociol*. 2000;26(1):341–365. doi:10.1146/annurev.soc.26.1.341
26. Benach J, Vives A, Amable M, Vanroelen C, Tarafa G, Muntaner C. Precarious employment: Understanding an emerging social determinant of health. *Annu Rev Public Health*. 2014;35(1):229–253. doi:10.1146/annurev-publhealth-032013-182500 [PubMed: 24641559]
27. Tompa E, Scott-Marshall H, Dolinschi R, Trevithick S, Bhattacharyya S. Precarious employment experiences and their health consequences: towards a theoretical framework. *Work*. 2007;28(3):209–224. [PubMed: 17429147]
28. Julià M, Vanroelen C, Bosmans K, Van Aerden K, Benach J. Precarious employment and quality of employment in relation to health and well-being in Europe. *Int J Heal Serv*. 2017;47(3):389–409. doi:10.1177/0020731417707491
29. Vives A, Gonzalez Lopez F, Benach J. Measuring precarious employment: Type of contract can lead to serious misclassification error. *Ann Work Expo Heal*. 2020;64(9):1035–1038. doi:10.1093/annweh/wxaa089
30. Oddo VM, Zhuang CC, Andrea SB, et al. Changes in precarious employment in the United States: A longitudinal analysis. *Scand J Work Environ Health*. 2020;46(3): 321–329. doi:10.5271/sjweh.3939 [PubMed: 31735974]
31. Weil D *The Fissured Workplace*. Harvard University Press; 2014.
32. Clarke M, Lewchuk W, de Wolff A, King A. “This just isn’t sustainable”: Precarious employment, stress and workers’ health. *Int J Law Psychiatry*. 2007;30(4–5):311–326. doi:10.1016/j.ijlp.2007.06.005 [PubMed: 17764742]
33. Scott-Marshall H, Tompa E. The health consequences of precarious employment experiences. *Work*. 2011;38(4):369–382. doi:10.3233/WOR-2011-1140 [PubMed: 21508526]
34. Schur LA. Dead end jobs or a path to economic well being? The consequences of non-standard work among people with disabilities. *Behav Sci Law*. 2002;20(6):601–620. doi:10.1002/bsl.512 [PubMed: 12465130]
35. Pagán R Is part-time work a good or bad opportunity for people with disabilities? A European analysis. *Disabil Rehabil*. 2007;29(24):1910–1919. doi:10.1080/09638280701192881 [PubMed: 17852307]
36. Ali M, Schur L, Blanck P. What types of jobs do people with disabilities want? *J Occup Rehabil*. 2011;21(2):199–210. doi:10.1007/s10926-010-9266-0 [PubMed: 20924777]
37. U.S. Bureau of Labor Statistics. Persons with a disability: labor force characteristics summary. Published 2 26, 2020. Accessed November 30, 2020. <https://www.bls.gov/news.release/disabl.nr0.htm>
38. Schur LA. Barriers or opportunities? The causes of contingent and part-time work among people with disabilities. *Ind Relations A J Econ Soc*. 2003;42(4):589–622. doi:10.1111/1468-232X.00308
39. Avendano M, Berkman LF. Labor markets, employment policies, and health. In: Berkman LF, Kawachi I, & Glymour MM (Eds.) *Social epidemiology*. Oxford University Press; 2014:182–233.
40. Emerson E, Hatton C, Robertson J, Baines S. The association between non-standard employment, job insecurity and health among British adults with and without intellectual impairments: Cohort study. *SSM - Popul Heal*. 2018;4:197–205. doi:10.1016/J.SSMPH.2018.02.003

41. Konrad AM, Moore ME, Ng ESW, Doherty AJ, Breward K. Temporary work, underemployment and workplace accommodations: Relationship to well-being for workers with disabilities. *Br J Manag.* 2013;24(3):367–382. doi:10.1111/j.1467-8551.2011.00809.x
42. Shuey KM, Jovic E. Disability accommodation in nonstandard and precarious employment arrangements. *Work Occup.* 2013;40(2):174–205. doi:10.1177/0730888413481030
43. Kim IH, Muntaner C, Vahid Shahidi F, Vives A, Vanroelen C, Benach J. Welfare States, Flexible employment, and health: A critical review. *Health Policy (New York).* 2012;104(2):99–127. doi:10.1016/j.healthpol.2011.11.002
44. Washington State Department of Labor and Industries. Medical Examiners' Handbook. Publication F252-001-000; 2019.
45. Washington State Department of Labor and Industries. Permanent Partial Disability. PPD Award Schedules. <https://lni.wa.gov/claims/for-workers/claim-benefits/permanent-partial-disability>. Accessed May 17, 2020.
46. The American Association for Public Opinion Research. Standard Definitions: Final Dispositions of Case Codes and Outcome Rates for Surveys. 9th edition. Oakbrook Terrace, IL: AAPOR; 2016.
47. State of Washington. RCW Title 51: Chapter 51.12. Employments and occupations covered; <http://apps.leg.wa.gov/rcw/default.aspx?Cite=51.12>. Accessed July 29, 2020.
48. Benach J, Vives A, Tarafa G, Delclos C, Muntaner C. What should we know about precarious employment and health in 2025? Framing the agenda for the next decade of research. *Int J Epidemiol.* 2016;45(1):232–238. doi:10.1093/ije/dyv342 [PubMed: 26744486]
49. Kalleberg AL. Measuring Precarious Work – A Working Paper of the EINet Measurement Group. University of North Carolina at Chapel Hill; 2014.
50. Bodin T, Ça layan Ç, Garde AH, et al. Precarious employment in occupational health – An omega-net working group position paper. *Scand J Work Environ Heal.* 2020;46(3):321–329. doi:10.5271/sjweh.3860
51. Hagedorn J, Paras CA, Greenwich H, Hagopian A. The role of labor unions in creating working conditions that promote public health. *Am J Public Health.* 2016;106(6):989–995. doi:10.2105/AJPH.2016.303138 [PubMed: 27077343]
52. Malinowski B, Minkler M, Stock L. Labor unions: A public health institution. *Am J Public Health.* 2015;105(2):261–271. doi:10.2105/AJPH.2014.302309 [PubMed: 25521905]
53. Huang Y hsiang, Lee J, Chen Z, Perry M, Cheung JH, Wang M. An item-response theory approach to safety climate measurement: The Liberty Mutual Safety Climate short scales. *Accid Anal Prev.* 2017;103:96–104. doi:10.1016/j.aap.2017.03.015 [PubMed: 28391093]
54. Buysse DJ, Yu L, Moul DE, Germain A, Stover A, Dodds NE, Johnston KL, Shablesky-Cade MA, Pilkonis PA. Development and validation of patient-reported outcome measures for sleep disturbance and sleep-related impairments. *Sleep.* 2010;33(6):781–792. [PubMed: 20550019]
55. Sears JM, Wickizer TM, Schulman BA. Improving vocational rehabilitation services for injured workers in Washington State. *Eval Program Plann.* 2014;44:26–35. doi:10.1016/j.evalprogplan.2013.12.006 [PubMed: 24509051]
56. Young AE, Besen E, Choi Y. The importance, measurement and practical implications of worker's expectations for return to work. *Disabil Rehabil.* 2015;37(20):1808–1816. doi:10.3109/09638288.2014.979299 [PubMed: 25374043]
57. Ingram DD, Franco SJ. 2013 NCHS Urban-Rural Classification Scheme for Counties. US Department of Health and Human Services, Centers for Disease Control and Prevention; 2014.
58. Midi H, Sarkar SK, Rana S. Collinearity diagnostics of binary logistic regression model. *J Interdiscip Math.* 2010;13(3):253–267. doi:10.1080/09720502.2010.10700699
59. StataCorp LLC. Stata Statistical Software: Release 15. 2017; College Station, Texas, United States.
60. Dedoose Version 8.3.35, Web Application for Managing, Analyzing, and Presenting Qualitative and Mixed Method Research Data 2020; Los Angeles, CA. Sociocult Resesarch Consultants, LLC.
61. Hsieh H-F, Shannon SE. Three approaches to qualitative content analysis. *Qual Health Res.* 2005;15(9):1277–1288. [PubMed: 16204405]
62. Mai QD, Hill TD, Vila-Henninger L, & Grandner MA. Employment insecurity and sleep disturbance: evidence from 31 European countries. *Journal of sleep research.* 2019; 28(1), e12763. [PubMed: 30156336]

63. Schur L, Han K, Kim A, Ameri M, Blanck P, Kruse D. Disability at work: A look back and forward. *J Occup Rehabil.* 2017;27(4):482–497. doi:10.1007/s10926-017-9739-5 [PubMed: 29110160]
64. Sears JM, Schulman BA, Fulton-Kehoe D, Hogg-Johnson S. Estimating time to reinjury among Washington State injured workers by degree of permanent impairment: Using state wage data to adjust for time at risk. *Am J Ind Med.* 2021;64(13):13–25. [PubMed: 33210293]
65. Quinlan M, Bohle P. Overstretched and unreciprocated commitment: Reviewing research on the occupational health and safety effects of downsizing and job insecurity. *Int J Heal Serv.* 2009;39(1):1–44. doi:10.2190/HS.39.1.a
66. Quinlan M, Mayhew C, Bohle P. The global expansion of precarious employment, work disorganization, and consequences for occupational health: A review of recent research. *Int J Heal Serv.* 2001;31(2):335–414. doi:10.2190/607H-TTV0-QCN6-YLT4
67. Kreshpaj B, Orellana C, Burström B, et al. What is precarious employment? A systematic review of definitions and operationalizations from quantitative and qualitative studies. *Scand J Work Environ Health.* 2020; 46(3):235–247. doi:10.5271/sjweh.3875 [PubMed: 31901944]
68. Sears JM, Edmonds AT, Coe NB. Coverage gaps and cost-shifting for work-related injury and illness: Who bears the financial burden? *Med Care Res Rev.* 2020;77(3):223–235. doi:10.1177/1077558719845726 [PubMed: 31018756]
69. Gevaert J, Van Aerden K, De Moortel D, Vanroelen C. Employment quality as a health determinant: Empirical evidence for the waged and self-employed. *Work Occup.* 2020; 073088842094643. doi:10.1177/0730888420946436

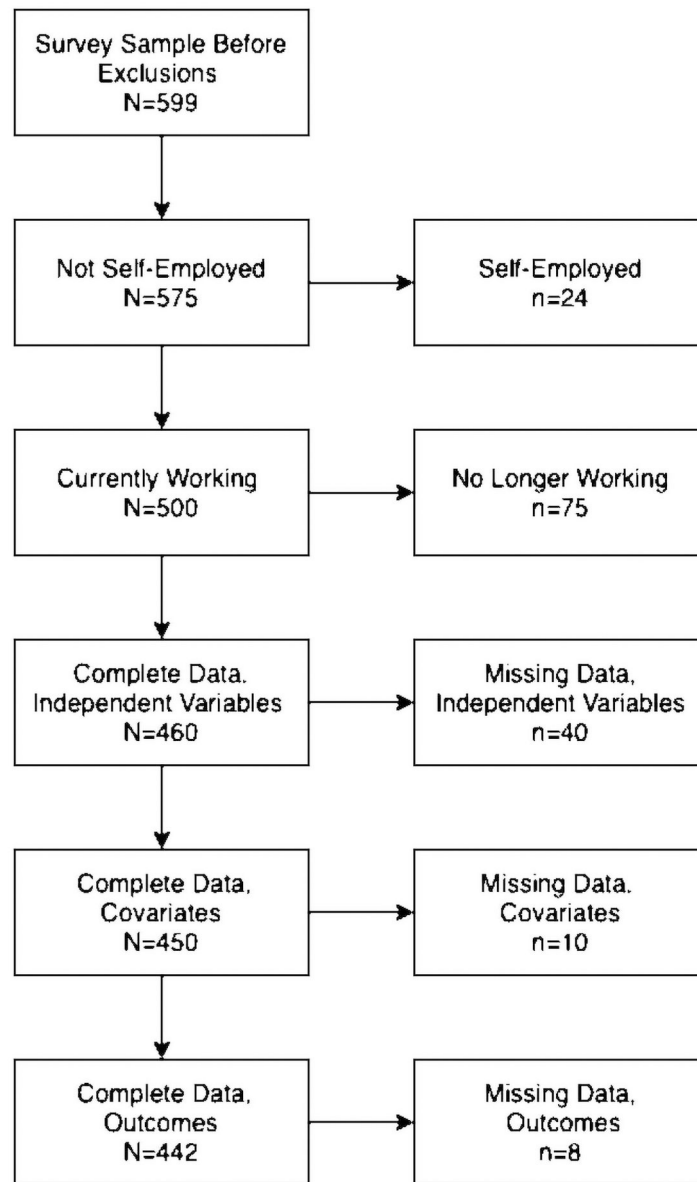


Figure 1.
Inclusion Criteria

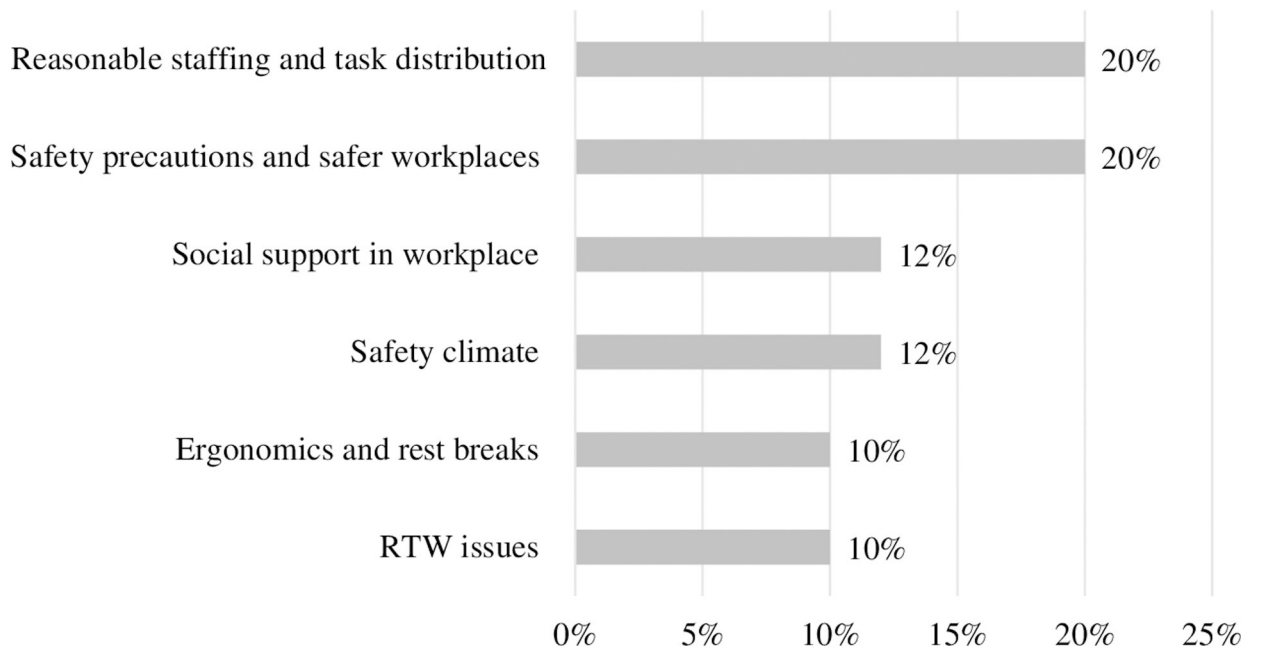


Figure 2.
Frequent Suggestions for Promoting Sustained RTW, Workers in Nonstandard and Precarious Jobs

Table 1.

Descriptive Characteristics of Disabled Workers in Nonstandard and Precarious Employment (N=442)

	Overall N=442		Nonstandard n=54		Full-time Permanent n=388		Precarious n=72		Less Precarious n=370	
	n	%	n	%	n	%	n	%	n	%
SOCIODEMOGRAPHIC CHARACTERISTICS										
Age (years) in Categories										
18–34	59	(13)	11	(20)	48	(12)	14	(20)	45	(12)
35–44	97	(22)	11	(20)	86	(22)	16	(20)	81	(22)
45–54	120	(27)	12	(22)	108	(28)	14	(22)	106	(29)
55	166	(38)	20	(37)	146	(38)	28	(39)	138	(38)
Female	141	(32)	27	(50)	114	(29)	30	(42)	111	(30)
Educational Attainment										
HS Diploma/GED or Less	127	(29)	10	(19)	117	(30)	17	(24)	110	(30)
Some College	224	(51)	28	(52)	196	(51)	37	(51)	187	(51)
4-year College or Greater	91	(21)	16	(30)	75	(19)	18	(25)	73	(20)
Race/Ethnicity										
Hispanic/Latino	19	(4)	4	(7)	15	(4)	3	(4)	16	(4)
White	363	(82)	39	(72)	324	(84)	59	(82)	304	(82)
Black/African American	13	(3)	4	(7)	9	(2)	3	(4)	10	(3)
Asian/NHPI	25	(6)	4	(7)	21	(5)	4	(6)	21	(6)
Multiple/Other	22	(5)	3	(6)	19	(5)	3	(4)	19	(5)
Rurality (residence) ^a										
Large central metropolitan	84	(19)	13	(24)	71	(18)	15	(2)	69	(19)
Large fringe metropolitan	153	(35)	18	(33)	135	(35)	19	(26)	134	(36)
Medium metropolitan	97	(23)	8	(15)	89	(23)	19	(26)	78	(22)
Small metropolitan	48	(11)	7	(13)	41	(11)	7	(10)	41	(11)
Non-metropolitan	60	(14)	8	(15)	52	(13)	12	(17)	48	(13)
IMPAIRMENT AND HEALTH CHARACTERISTICS										
Health at Claim Closure										
Excellent	53	(12)	4	(7)	49	(13)	4	(6)	49	(13)
Very Good	110	(25)	15	(28)	95	(24)	15	(21)	95	(26)
Good	169	(38)	17	(31)	152	(39)	32	(44)	137	(37)
Fair	90	(20)	15	(28)	75	(19)	16	(22)	74	(20)
Poor	20	(5)	3	(6)	17	(4)	5	(7)	15	(4)
Whole Body Impairment 10%	98	(22)	13	(24)	85	(22)	14	(20)	84	(23)
EMPLOYMENT AND SYSTEM CHARACTERISTICS										
No Longer Employed by Pre-Injury Employer	114	(26)	26	(48)	88	(23)	36	(50)	78	(21)
Changed Type of Work Post-Injury/Illness	124	(28)	25	(46)	99	(26)	34	(47)	90	(24)
Self-insured WC Employer	171	(39)	21	(39)	150	(39)	16	(22)	155	(42)

	Overall N=442		Nonstandard n=54		Full-time Permanent n=388		Precarious n=72		Less Precarious n=370	
	n	%	n	%	n	%	n	%	n	%
Reported More Than 1 Job in Last Year	85	(19)	22	(41)	63	(16)	26	(36)	59	(16)

^aRurality defined by 2013 Urban-Rural Classification Scheme for Counties

Author Manuscript

Author Manuscript

Author Manuscript

Author Manuscript

Table 2.

Prevalence of Outcomes (N=442)

	Overall n=442		Nonstandard n=54		Full-Time Permanent n=388		Precarious n=72		Less Precarious n=370	
	n	(%)	n	(%)	n	(%)	n	(%)	n	(%)
Fair/Poor Self-Rated Health	106	(24)	15	(28)	91	(23)	25	(35)	81	(22)
Reinjury	57	(13)	5	(9)	52	(13)	9	(13)	48	(13)
Poor Sleep Quality	98	(22)	14	(26)	84	(22)	24	(33)	74	(20)
Unmet Need for Accommodation	52	(12)	11	(21)	41	(11)	18	(25)	34	(9)
Financial Strain	58	(15)	14	(26)	54	(14)	18	(25)	50	(14)
Low expectations for sustained RTW	105	(15)	54	(30)	51	(13)	22	(31)	45	(12)

Author Manuscript

Author Manuscript

Author Manuscript

Author Manuscript

Table 3.

Associations Between Nonstandard and Precarious Jobs and Outcomes Among Disabled Workers (N=442)

	Nonstandard <i>Part-time, temporary, seasonal employment</i>						Precarious <i>3 Indicators of Precarious employment</i>					
	OR	95% CI	p-value	AOR	95% CI	p-value	OR	95% CI	p-value	AOR	95% CI	p-value
Fair/Poor Self-Rated Health	1.26	(0.66 – 2.38)	0.487	1.08	(0.50 – 2.35)	0.838	1.90	(1.10 – 3.27)	0.021	2.35	(1.21 – 4.53)	0.011
Reinjury	0.66	(0.25 – 1.73)	0.398	0.85	(0.30 – 2.37)	0.758	0.96	(0.45 – 2.05)	0.913	1.41	(0.59 – 3.40)	0.441
Poor Sleep Quality	1.27	(0.66 – 2.44)	0.480	1.20	(0.58 – 2.48)	0.615	2.00	(1.15 – 3.47)	0.014	1.88	(0.99 – 3.60)	0.055
Unmet Need for Accommodation	2.17	(1.04 – 4.52)	0.040	1.62	(0.75 – 3.50)	0.216	3.29	(1.74 – 6.25)	<0.001	3.90	(1.89 – 8.07)	<0.001
Financial Strain	2.16	(1.10 – 4.25)	0.025	1.55	(0.71 – 3.38)	0.272	2.13	(1.16 – 3.93)	0.015	1.71	(0.83 – 3.53)	0.144
Low expectations for sustained RTW	2.78	(1.45 – 5.36)	0.002	3.18	(1.55 – 6.53)	0.002	3.18	(1.76 – 5.74)	<0.001	3.13	(1.65 – 5.92)	<0.001

Results of quantitative analyses are presented as odd ratios (OR) and adjusted odds ratios (AOR). Adjusted models include the following covariates: age (in categories), sex, educational attainment, race/ethnicity, rurality, health at claim closure, whole body impairment > 10%, changed from pre-injury employer, changed from pre-injury work/occupation, self-insured WC employer, and more than one job since claim closure. Reference population for nonstandard is full-time traditional; reference population for precarious is less precarious